

## CONTROL DEVICE AND CONTROL METHOD

### BACKGROUND

[0001] Technical Fields

[0002] The disclosure relates to a control device and a control method.

[0003] Priority is claimed on Japanese Patent Application No. 2015-185017, filed Sep. 18, 2015, the contents of which are incorporated herein by reference.

[0004] Related Art

[0005] In a plant and a factory (hereinafter, called simply "plant" as a generic name of them), a process control system is established, and an advanced automatic operation is implemented. The process control system controls various types of state quantity (for example, pressure, temperature, flow quantity) in an industrial process. In order to secure safety and perform an advanced control, the process control system is equipped with a control system such as a distributed control system (DCS) and a safety system such as a safety instrumented system (SIS).

[0006] In the distributed control system, field devices (for example, a measurement device and a manipulation device) and a control device controlling the field devices are connected to each other through communication means. In the distributed control system, the control device collects measurement data measured by the field devices, and the control device operates (controls) the field devices in accordance with the collected measurement data, in order to control various types of state quantity. In an emergency, the safety instrumented system stops the plant certainly in a safe state. Thereby, physical injury and environmental pollution are prevented beforehand, and expensive facilities are protected.

[0007] In the conventional safety instrumented system, field devices which detect gas, flame, heat, smoke are prepared, and an alarm is output in accordance with a detection result of the field device. For example, a fire detecting system which is equipped with a carbon monoxide detector is disclosed in U.S. Pat. No. 8,354,935. If a level of the carbon monoxide measured by the carbon monoxide detector exceeds a threshold value, an alarm is output to an alarm panel.

[0008] High reliance and stable operation are required for the distributed control system and the safety instrumented system in order to secure safety of the plant. Therefore, high reliability and high maintainability are required for a program (application logic) which runs on the control device. For this reason, it is not preferable that proven application logic is changed greatly. In some industries or companies, a rule (policy) of programming is often made formally or implicitly.

[0009] On the other hand, with respect to hardware such as an interface module and a field device, new parts are adopted in accordance with technical progress, parts are discontinued, and parts are changed in accordance with cost reduction demands, in many cases. For this reason, in the conventional control device, it is necessary that the application logic is changed greatly in accordance with a change of hardware. Otherwise, it is necessary that a part of an improvement effect by the change of the hardware is given up, and a change range of the application logic is reduced.

### SUMMARY

[0010] A control device may include an interface module configured to supply electric power to a field device installed in a plant, an application executor configured to output a reset signal for resetting the field device, and a converter configured to convert the reset signal, which has been output from the application executor, into a format which is suitable for the interface module.

[0011] Further features and aspects of the present disclosure will become apparent from the following detailed description of exemplary embodiments with reference to the attached drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a block diagram illustrating a whole configuration of a process control system 1.

[0013] FIG. 2 is a block diagram illustrating operation of the control device 200 and the operation monitoring terminal 300.

[0014] FIG. 3 is a block diagram illustrating a processing performed in the control device 200.

[0015] FIG. 4 is a block diagram illustrating a detailed configuration of the A/I module 210.

[0016] FIG. 5 is a block diagram illustrating a whole configuration of a process control system 2 which is a comparison example.

[0017] FIG. 6 is a flow chart illustrating a processing of the control device 200.

### DETAILED DESCRIPTION OF THE EMBODIMENTS

[0018] The embodiments of the present invention will be now described herein with reference to illustrative preferred embodiments. Those skilled in the art will recognize that many alternative preferred embodiments can be accomplished using the teaching of the present invention and that the present invention is not limited to the preferred embodiments illustrated herein for explanatory purposes.

[0019] An aspect of the present invention is to provide a control device and a control method which can achieve an improvement effect by a change of hardware without changing application logic greatly.

[0020] Hereinafter, a control device and a control method of embodiments will be described with reference to drawings.

[0021] FIG. 1 is a block diagram illustrating a whole configuration of a process control system 1. As shown in FIG. 1, the process control system 1 is equipped with a field device 100, a control device 200, an operation monitoring terminal 300, and an engineering terminal 400. The process control system 1 is established in a plant.

[0022] The plant includes an industrial plant such as a chemical industrial plant, a plant managing and controlling a wellhead (for example, a gas field and an oil field), a plant managing and controlling a generation of electric power (for example, water power, fire power, and nuclear power), a plant managing and controlling a power harvesting (for example, solar power and wind power), a plant managing and controlling water supply and sewerage systems, a dam, and so on.

[0023] The field device 100 is such as a sensor device (for example, a flowmeter and a temperature sensor), a valve device (for example, a flow control valve and an on-off